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## ASTRONOMICAL OBSERVATIONS IN 1918

MADE BY TORVALD KÖHL, AT ODDER, DENMARK

## VARIABLE STARS

(The instrument used is a 3-inch Steinheil, power 42.)

*R Ursae Majoris*<sup>1</sup>

Jan. 3: R invisible	Sept. 20: 2 steps > m
4: id.	29: = l
16: utmost faint	Oct. 9: $\begin{cases} = \\ < \end{cases}$ m
31: invisible	25: invisible
Feb. 11: id.	Nov. 4: id.
Aug. 31: 1 step < k	9: id.
Sept. 4: 1 step > h	22: id.
(h seems to be 2 steps	Dec. 22: id.
< k, while Hagen	26: id.
has h = 9 <sup>m</sup> .6	28: id.
k = 9 .9)	31: id.
9: = h	

*S Ursae Majoris*<sup>2</sup>

Jan. 2: S = e	Sept. 4: 2 steps > f'
4: 1 step < e	9: = f'
7: id.	12: = f
15: 3 steps < e	13: id.
16: id.	20: = g
31: 1 step > f'	27: id.
Feb. 8: = f'	29: id.
11: = f	Oct. 8: id.
14: id.	25: < g
27: = g	30: invisible
Mar. 1: = g	Nov. 3: id.
2: id.	4: id.
3: id.	9: id.
5: id.	22: $\begin{cases} > \\ < \end{cases}$ g
7: 1 step < g	24: = f'
9: id.	Dec. 22: = e
17: = g	26: id.
July 31: 1 step > d	28: 1 step < e
Aug. 10: = d	31: = e
18: = e	
24: 1 step < e	
31: $\begin{cases} \text{half-way between} \\ e \text{ and } f' \end{cases}$	

<sup>1</sup>Vide the sketch in the *Publications A. S. P.*, No. 175, 30, 181.<sup>2</sup>Vide the sketch in the *Publications A. S. P.*, No. 73, 12, 56.

T *Ursae Majoris*<sup>3</sup>

Jan. 2: T 2 steps > g	Aug. 24: = e
4: = g	31: 3 steps < e
7: 2 steps < g	Sept. 4: { half-way between g and e
15: invisible	9: 2 steps > g
16: id.	12: 1 step < g
31: id.	13: id.
Feb. 8: id.	20: 3 steps < g
11: id.	27: id.
14: id.	29: id.
27: id.	Oct. 8: 5 steps < g
Mar. 1: id.	25: invisible
2: id.	30: id.
3: id.	Nov. 3: id.
5: id.	4: id.
7: id.	9: id.
9: id.	22: id.
17: id.	24: id.
Aug. 10: = d	Dec. 22: = g
18: { half-way between d and e	26: 2 steps > g
	28: 2 steps < e
	31: = e

Var. 25, 1913, *Ursae Majoris*

(B. D. + 60° 1412 (9<sup>m</sup>.5) = f in the sketch for T *Ursae Majoris*.)

Jan. 2: 2 steps > g	Aug. 24: 1 step < g
4: = g	31: = g
7: id.	Sept. 4: id.
15: 2 steps > g	9: { = > g
16: 1 step > g	12: 1 step < g
31: = g	20: 1 step > g
Feb. 8: 2 steps > g	27: = g
11: 1 step > g	29: id.
14: = g	Oct. 8: 1 step < g
27: 3 steps > g	25: 1 step > g
Mar. 2: 2 steps > g	Nov. 3: { < = g
3: id.	9: 1 step < g
5: id.	22: 1 step > g
7: { half-way between e and g	24: id.
9: e (3) f (2) g	Dec. 22: 2 steps > g
17: 1 step > g	26: id.
Aug. 10: 1 step < g	28: id.
18: 2 steps < g	31: = g

<sup>3</sup>Vide the sketch in the *Publications A. S. P.*, No. 22, 4, 63.

*S Persei*<sup>4</sup>

Feb. 13: S = d	Sept. 9: id.
Mar. 3: id.	20: id.
9: = e	29: id.
Apr. 10: $\begin{cases} < e \\ > f \end{cases}$	Oct. 9: 1 step < e
May 5: = e	25: $\begin{cases} \text{half-way between} \\ e \text{ and } d \end{cases}$
Aug. 31: id.	Nov. 4: = e
	22: $\begin{cases} = \\ < e \end{cases}$

*W Persei*<sup>5</sup>

Feb. 13: W $\begin{cases} 2 \text{ steps } > f \\ 5 \text{ steps } < e \end{cases}$	Sept. 29: 2 steps < n
27: $\begin{cases} \text{half-way between} \\ g \text{ and } f \end{cases}$	Oct. 9: < n
May 5: = f	25: 4 steps < n
Aug. 31: 2 steps > n	Nov. 4: id.
Sept. 9: = n	22: < n
20: 3 steps < n	

*R Aurigae*<sup>6</sup>

May 5: R invisible	Oct. 25: = l
Aug. 31: = k	Nov. 9: = k
Sept. 9: 1 step < h	22: $\begin{cases} = g \\ g \text{ seems } < h \end{cases}$
20: = h	Dec. 22: 1 step > e
29: id.	28: $\begin{cases} \text{half-way between} \\ e \text{ and } d \end{cases}$
Oct. 9: = g	

*Y Tauri*

The comparison stars have been:

$$A = B. D. + 20^{\circ} 1095 (7^m.4)$$

$$b = B. D. + 20^{\circ} 1073 (8^m.2)$$

Jan. 2: Y 2 steps > A	Apr. 10: $\begin{cases} < A \\ > b \end{cases}$
4: 1 step > A	
7: id.	Oct. 2: $\begin{cases} = A \\ < A \end{cases}$
15: id.	25: 2 steps < A
31: = A	30: 3 steps < A
Feb. 11: 2 steps < A	Nov. 9: = b
27: $\begin{cases} < A \\ > b \end{cases}$ nearest b	11: 2 steps > b
Mar. 1: 2 steps > b	24: 3 steps > b
17: $\begin{cases} < A \\ > b \end{cases}$	Dec. 22: 1 step < A
30: = b	26: id.
	28: id.

<sup>4</sup>Vide the sketch in the *Publications A. S. P.*, No. 135, 23, 43.

<sup>5</sup>Vide the sketch in the *Publications A. S. P.*, No. 175, 30, 182.

<sup>6</sup>Vide the sketch in the *Publications A. S. P.*, No. 175, 30, 183.

U *Herculis*<sup>7</sup>

Apr. 10: U invisible	Sept. 20: = a
18: id.	29: id.
27: id.	Oct. 8: 1 step < a
May 1: id.	25: { half-way between
4: id.	a and c
Aug. 10: = e	30: 2 steps > c
24: = c	Nov. 3: > c
31: id.	9: { half-way between c
Sept. 3: 2 steps > c	and d
9: 4 steps < a	11: 1 step < c
12: 1 step < a	22: = d
	24: id.

SS *Cygni*<sup>8</sup>

Jan. 7, 6 <sup>h</sup> : SS 3 steps < h	Oct. 30, 11 <sup>h</sup> : 11 <sup>m</sup> .5
31, 6 <sup>h</sup> : 2 steps > c	Nov. 9, 9 <sup>h</sup> : = b
Feb. 1, 7 <sup>h</sup> : 1 step > c	11, 8 <sup>h</sup> : = c
11, 7 <sup>h</sup> : = d'	22, 8 <sup>h</sup> : invisible
Apr. 18, 11 <sup>h</sup> : invisible	Dec. 22, 6 <sup>h</sup> : = f
May 1, 10 <sup>h</sup> : = h	28, 6 <sup>h</sup> : = g
	31, 7 <sup>h</sup> : id.

R *Coronae*<sup>9</sup>

Mar. 5: a (3) R (1) b	Sept. 4: 5 steps > a
Apr. 10: a (1) R (1) b	9: id.
18: a (2) R (1) b	12: 4 steps > a
27: id.	20: id.
Aug. 24: 5 steps > a	29: id.
31: id.	Oct. 8: id.

W *Pegasi*<sup>11</sup>

Jan. 2: W = h	Sept. 20: 3 steps < n
7: id.	27: invisible
16: { > g	29: id.
< f	Oct. 9: id.
17: id.	25: id.
31: 1 step > c	27: id.
Feb. 2: = f	Nov. 9: id.
14: 2 steps > f	22: id.
Aug. 31: = n	Dec. 22: = h
Sept. 4: 1 step > n	28: { half-way between
9: 1 step < n	g and h
12: < n	31: = h

<sup>7</sup>I have used the sketch in the *Publications A. S. P.*, No. 106, 18, 52, but have added two small neighboring stars, *g* at *a* and *h* at *f*, both northward.

<sup>8</sup>View the sketch in the *Publications A. S. P.*, No. 141, 24, 109.

<sup>9</sup>View the sketch in the *Publications A. S. P.*, No. 175, 30, 184.

<sup>10</sup>View the sketch in the *Publications A. S. P.*, No. 141, 24, 109.

TV *Cygni*<sup>11</sup>

Jan. 7: TV	$\begin{cases} < b \\ > c \end{cases}$	May 1: 2 steps	$> c$
31: id.		Nov. 9: 2 steps	$> d$
Feb. 11: = c		Dec. 22: $\begin{cases} \text{half-way between} \\ b \text{ and } c \end{cases}$	
Apr. 27: id.		31: 1 step	$> c$

## A NEW VARIABLE STAR

While observing the region about  $\alpha$  *Leonis* on March 6th, 1918, and comparing two Carina-plates, No. 51 (April 18, 1915) and No. 60 (April 15, 1916) I found a great disagreement concerning the star  $V = B. D. + 14^\circ 2194 (9^m.5)$ , which now is Var. 5, 1918 *Leonis* (A. N. 4937). The comparison-stars have been:

$q = B. D. + 14^\circ 2190 \ 8^m.8$	} The magnitudes according to my own judgment.
$z = B. D. + 14^\circ 2197 \ 9 \ .4$	
$y = B. D. + 14^\circ 2199 \ 9 \ .7$	
$p = B. D. + 14^\circ 2195 \ 10 \ .2$	

Mar.	6: V 3 steps < y	Apr.	28: id.
	7: < y		29: id.
	9: < y	May	1: id.
	17: 2 steps < y		2: id.
	30: 2 steps > z		4: id.
Apr.	5: 3 steps > z		5: q (1) v (1) z
	10: q (1) v (2) z		6: id.
	11: 4 steps > z		7: id.
	17: > z		12: $\begin{cases} = \\ < q \end{cases}$
	18: q (4) v (5) z	Oct.	2: 1 step < q
	23: id.		31: $\begin{cases} = \\ > z \end{cases}$
	27: id.	Nov.	12: 2 steps > y
		Dec.	31: z (3) v (1) y

Several other stars, suspected of variation, have also been watched in the year 1918. My observations on *Nova Aquilae* 3 have been sent to Cambridge, Mass., in response to Bulletin 661 from Harvard College Observatory. On this occasion, reviewing some comparison-stars near  $\gamma$  *Aquilae*, I found that the star  $B. D. + 1^\circ 3546 (9^m.5)$  was *not visible*.

## LARGE METEORS

Fireballs have been observed from Denmark on the following dates: May 4th, 16th, July 6th, August 11th (4 observations),

<sup>11</sup>Vide the sketch in the *Publications A. S. P.*, No. 135, 23, 43.

August 13th (3 observations), *September 27th* and November 12th. Already several years ago I noted September 27th as a "Fireball-day."

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The Carina-Meteor catalog has now reached the number of 6568 meteors observed from stations in Denmark and surrounding countries from 1875 to 1918 inclusive.

From August 12th to 17th, inclusive, astronomical lectures were held at the Carina-Observatory in Odder, and besides these thirty-six popular lectures were given this year at different places in Denmark. The entire number of my lectures in the course of many years is now 1429.

By the aid of a 78<sup>mm</sup> Darlot lens, Mr. *J. Skakke* has in this year photographed several regions of the heavens.